

FORM PTO-1449

# INFORMATION DISCLOSURE CITATION IN AN APPLICATION

(Use several sheets if necessary)

5491

Docket Number (Official)  
1390.C1/PVD/DVApplication Number  
08/851,946Applicant  
Nulman et alFiling Date  
5/6/97

Group Art Unit

Case U.S. PTO  
10/052951  
01/17/02

## U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER							DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
<i>Mr</i>	5	9	6	1	7	9	3	10/5/99	Ngan	204	192.12	
<i>Mr</i>	3	6	1	9	4	0	2	11/9/71	Wurm	204	290.17	

## FOREIGN PATENT DOCUMENTS

	DOCUMENT NUMBER							DATE	COUNTRY	CLASS	SUBCLASS	Translation	
												YES	NO
<i>Mr</i>	9	2	0	7	9	6	9	5/14/92	PCT				

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

AT Search Report issued 11/19/99 in application SI9701437-7

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.

O/SB/ 08 (10-92)

Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

2.22.1000

FORM PT -1449

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5/8/97

Group Art Unit

## U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER							DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
<i>Y</i>	5	6	9	0	7	8	1	11/25/97	Yoshida et al	156	345.48	
<i>Y</i>	5	4	3	4	3	5	3	7/18/95	Kraus	174	15.6	

## FOREIGN PATENT DOCUMENTS

	DOCUMENT NUMBER							DATE	COUNTRY	CLASS	SUBCLASS	Translation	
												YES	NO
<i>Y</i>	0	7	2	7	8	0	7	23Jan96	EPO				
	9	5	1	5	6	7	2	8June95	PCT				
	0	6	0	1	5	9	5	10Dec93	EPO				
<i>Y</i>	8	8	8	1	9	0		2Apr98	Japan				

## OTHER DOCUMENTS (including Author, Title, Date, Pertinent Pages, Etc.)

<i>Y</i>	PCT Search Report issued in Appln PCT/US98/09739

EXAMINER <i>Robert M. Smith</i>	DATE CONSIDERED <i>7/21/03</i>
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EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.

<b>FORM PTO-1449</b>  <b>INFORMATION DISCLOSURE CITATION IN AN APPLICATION</b>  <i>(Use several sheets if necessary)</i>				<b>Docket Number (Optional)</b> 1390.C1/PVD/DV		<b>Applicati n Numbr</b> 08/851,946	
				<b>Applicant</b> Nulman et al			
				<b>Filing Date</b> 5/6/97		<b>Group Art Unit</b>	

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U.S. PATENT DOCUMENTS											
EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE					

FOREIGN PATENT DOCUMENTS														
	DOCUMENT NUMBER								DATE	COUNTRY	CLASS	SUBCLASS	Translati n	
													YES	NO
<i>ms</i>	7	1	7	6	3	9	8	21May86	Japan (Abstract				X	
<i>ms</i>	63	2	4	6	8	1	4	13Oct88	Japan Abstract				X	

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)											
<i>ms</i>	U.S. Serial No. 08/857,719 (Atty. Dkt. 1752) ✓										
	U.S. Serial No. 08/857,720 (Atty. Dkt. No. 1800) ✓										
	U. S. Serial No. 08/857,921 (Atty. Dkt. No. 1737) ✓										
	U.S. Serial No. 08/857,944 (Atty. Dkt. 1871) ✓										
	U.S. Serial No. 08/907,382 (Atty. Dkt. 1957) ✓										
	U.S. Serial No. 08/908,342 (Atty. Dkt. 1620) ✓										
	U.S. Serial No. 08/931,170 (Atty. Dkt. 1812) ✓										
	U.S. Serial No.08/971,867 (Atty. Dkt. 1957.P1) ✓										
	U.S. Serial No. 09/039,695 (Atty. Dkt. 1727) ✓										
	U.S. Serial No. 09/049,276 (Atty. Dkt. 938.D2) ✓										
<i>ms</i>	U.S. Serial No. 09/049,839 (Atty. Dkt. 938.D1) ✓										

EXAMINER <i>Robert McDonald</i>	DATE CONSIDERED <i>7/21/02</i>
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# INFORMATION DISCLOSURE CITATION IN AN APPLICATION

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08/851,946

Applicant  
Nulman t al

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Group Art Unit

JP866 U.S. PTO  
10/052951  
01/17/02

## U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER							DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
<i>John</i>	4	3	3	6	1	1	8	6/22/82	Patten et al.	204	192.12	
	4	6	2	6	3	1	2	12/2/86	Tracy	156	398.14	
	4	6	6	1	2	2	8	4/28/87	Mintz	254	192.25	
	4	8	7	1	4	2	1	10/3/89	Ogle et al.	438	770	
	4	9	4	1	9	1	5	7/17/90	Matsuoka et al.	204	192.12	
	4	9	9	9	0	9	6	3/12/91	Nihei et al.	204	192.3	
	5	1	7	8	7	3	9	1/12/93	Barnes et al.	204	192.12	
	5	4	3	0	3	5	5	7/4/95	Paranjpe	315	111.21	
	5	5	0	3	6	7	6	4/2/96	Shufflebotham et al.	118	723MR	
<i>John</i>	5	5	7	3	5	9	5	11/12/96	Dible	118	723MP	

## FOREIGN PATENT DOCUMENTS

FOREIGN PATENT DOCUMENTS													
	DOCUMENT NUMBER							DATE	COUNTRY	CLASS	SUBCLASS	Translation	
												YES	NO
<i>John</i>	0	6	0	7	7	9	7	1/5/94	EPO				
<i>John</i>	59	1	9	0	3	6	3	10/29/84	Japan			X	

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

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FORM PTO-1449 U.S. Department of Commerce  
(REV. 7-80) PATENT AND TRADEMARK OFFICE

# INFORMATION DISCLOSURE STATEMENT

(Use several sheets if necessary)

Attorney Docket  
No.  
1390.C1/PVD/DV

Serial No.  
08/851,946

Applicant(s)  
NULMAN, et al.

Filing Date  
5/6/97

Group

<i>Mr</i>	AZ	5	2	8	0	1	5	4	1/18/94	Cuomo et al.	219	121.52	
	BA	5	2	3	1	3	3	4	7/27/93	Paranipe	315	111.21	
	BB	5	2	2	5	7	4	0	7/6/93	Ohkawa	315	111.41	
	BC	5	2	0	6	5	1	6	4/27/93	Keller et al.	250	492.2	
	BD	5	1	2	2	2	5	1	6/16/92	Campbell et al.	204	299.06	
	BE	5	0	9	1	0	4	9	2/25/92	Campbell et al.	216	37	
	BF	4	9	2	5	5	4	2	5/15/90	Kidd	427	531	
	BG	4	7	9	2	7	3	2	12/88	O'Loughlin	315	334	
	BH	5	2	4	1	2	4	5	8/93	Barnes et al.	315	111.41	
	BI	5	4	0	4	0	7	9	4/95	Ohkuni et al.	315	111.81	
	BJ	5	2	3	4	5	6	0	8/10/93	Kadlec et al.	204	192.12	
	BK	4	8	4	2	7	0	3	6/89	Class et al.	224	192.12	
	BL	5	4	0	1	3	5	0	3/28/95	Patrick et al.	156	345.48	
<i>Mr</i>													

## FOREIGN PATENT DOCUMENTS

		Document Number							Date	Country	Class	Sub-Class	Abstract	
													Yes	No
<i>Mr</i>	CA	0	5	2	0	5	1	9	12/10/92	EPO				
	CB	2	2	3	1	1	9	7	11/7/90	U.K.				
	CC	2	1	6	2	3	6	5	1/29/86	U.K.				
	CD	WO	8	6	0	6	2	3	11/20/86	PCT				
	CE	61	1	9	0	0	7	0	8/86	Japan (Abstract)				
	CF	6	2	8	3	4	7	0	10/7/94	Japan				
	CG	6	2	3	2	0	5	5	8/19/94	Japan				
	CH	7	1	7	6	3	9	9	7/14/95	Japan (Abstract)				
	CI	7	1	7	6	3	9	8	7/14/95	Japan (Abstract)				
<i>Mr</i>	CJ	8	1	5	3	7	1	2	6/11/96	Japan				

126.98

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(REV. 7-80) PATENT AND TRADEMARK OFFICE

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Serial No.  
08/851,946

Applicant(s)  
NULMAN, et al.

Filing Date  
5/8/97

Group

<i>John</i>	CK	8	2	8	8	2	5	9	11/1/96	Japan				

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

<i>John</i>	DA	M. Yamashita, "Sputter Type High Frequency Ion Source for Ion Beam Deposition Apparatus," <i>Jap. J. Appl. Phys.</i> , vol. 26, pp. 721-727, 1987
	DB	M. Yamashita, "Fundamental Characteristics of Built-in High Frequency Coil Type Sputtering Apparatus," <i>J. Vac. Sci. Technol.</i> , vol. A7, pp. 151-158, 1989
	DC	S.M. Rossnagel et al., "Metal Ion Deposition from Ionized Magnetron Sputtering Discharge," <i>J. Vac. Sci. Technol.</i> , vol. B12, pp. 449-453, 1994
	DD	S.M. Rossnagel et al., "Magnetron Sputter Deposition with High Levels of Metal Ionization," <i>Appl. Phys. Lett.</i> , vol. 63, pp. 3285-3287, 1993
	DE	S.M. Rossnagel, et al., "Filling Dual Damascene Interconnect Structures with AlCu and Cu Using Ionized Magnetron Deposition," <i>J. Vac. Sci. Technol.</i> , vol. B13, pp. 125-129, 1995
	DF	Y-W. Kim et al., "Ionized Sputter Deposition of AlCu: Film Microstructure and Chemistry," <i>J. Vac. Sci. Technol.</i> , vol. A12, pp. 3169-3175, 1994
	DG	J. Hopwood et al., "Mechanisms for Highly Ionized Magnetron Sputtering," <i>J. Appl. Phys.</i> , vol. 78, pp. 758-765, 1995
	DH	P. Kidd, "A Magnetically Confined and ECR Heated Plasma Machine for Coating and Ion Surface Modification Use," <i>J. Vac. Sci. Technol.</i> , vol. A9, pp. 466-473, 1991
	DI	W.M. Holber, et al., "Copper Deposition by Electron Cyclotron Resonance Plasma," <i>J. Vac. Sci. Technol.</i> , vol. A11, pp. 2903-2910, 1993
	DJ	S.M. Rossnagel, "Directional and Ionized Sputter Deposition for Microelectronics Applications," <i>Proc. of 3rd ISSP (Tokyo)</i> , pp. 253-260, 1995
	DK	M. Matsuoka et al., "Dense Plasma Production and Film Deposition by New High-Rate Sputtering Using an Electric Mirror," <i>J. Vac. Sci. Technol.</i> , A 7 (4), 2652-2657, Jul/Aug 1989
	DL	U.S. patent application serial No. 08/680,335, filed 7/10/96 (Atty. Dk. 1390-CIP/PVD/DV)
	DM	N. Jiwari et al., "Helicon wave plasma reactor employing single-loop antenna," <i>J. of Vac. Sci. Technol.</i> , A 12(4), pp. 1322-1327, Jul/Aug 1994
	DN	Search report dated 2/27/97, EPC application No. 96308251.6
	DO	U.S. patent application serial No. 08/677,588, filed July 9, 1996 (Atty. Dk. 1402/PVD/DV)
	DP	U.S. patent application serial No. 08/644,096, filed 5/10/96 (Atty. Dk. 1390/PVD/DV)
<i>John</i>	DQ	U.S. patent application serial No. 08/647,184, filed 5/9/96 (Atty. Dk. 1383/PVD/DV)

1-26-98